

WILKINSON, BARKER, KNAUER & QUINN

LAW OFFICES

1735 NEW YORK AVENUE, N. W.

WASHINGTON, D. C. 20006-5289

(202) 783-4141

FAX: (202) 783-5851

(202) 833-2360

June 29, 1993

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JUN 29 1993

Mr. William Caton  
Acting Secretary  
Federal Communications Commission  
1919 M Street, N.W., Room 222  
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

Re: PR Docket No. 93-61

Gentlemen:

Enclosed for filing are an original and four copies of the  
"Comments" of Domestic Automation Company in the above-referenced  
proceedings.

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**

Washington, D.C. 20554

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JUN 29 1993

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of

Amendment of Part 90 of the  
Commission's rules to Adopt  
Regulations for Automatic  
Vehicle Monitoring Systems

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PR Docket No. 93-61

RM-8013

**COMMENTS OF  
DOMESTIC AUTOMATION COMPANY**

LAWRENCE J. MOVSHIN

**WILKINSON, BARKER, KNAUER & QUINN**  
1735 New York Avenue, N.W.  
Washington, D.C. 20006  
(202) 783-4141

Dated: June 29, 1993

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### SUMMARY

Domestic Automation Company ("DAC") hereby comments on the changes to Parts 2 and 90 of the Commission's Rules proposed in the Notice of Proposed Rule Making (FCC 93-141, released April 9, 1993) (the "NPRM") in the above-referenced proceeding.

DAC has been working on spread spectrum developments for several years, with the next generation of spread spectrum systems scheduled for commercial rollout early next year. To the extent that the viability of the Part 15 allocations for spread spectrum technology are being threatened in this proceeding, DAC has a substantial interest in the proposals.

There are numerous wireless alternatives in existence or under consideration which are almost certain to embrace these types of location and monitoring services. Any demand for locator and monitoring services can be satisfied in many other portions of the radio spectrum.

While there has been little growth in the development of AVM systems until quite recently, the Commission has seen the development of a growing number of low power, lower cost unlicensed devices and systems utilizing advanced technologies under its more liberal Part 15 regulatory scheme. The NPRM provides a reasonable opportunity for the Commission to review and refine its policies toward Part 15 devices. In particular, this proceeding allows the Commission to recognize the substantial public interest benefits derived from devices operating under Part 15 so that policies can be developed which better accommodate competing uses of the spectrum to meet the public interest.

It should no longer be the rule that licensed devices are protected and the unlicensed products must give way when new radio service allocations or expansions are being considered. Rather, the Commission should give Part 15 uses of spectrum fair consideration and weight in determining the suitability of spectrum for additional congestion, from licensed or unlicensed services. The Commission can properly conclude here that non-AVM uses can be accommodated in other parts of the spectrum under consideration for a wide array of non-voice messaging services.

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PR Docket No. 93-61

RM-8013

To: The Commission

**COMMENTS OF  
DOMESTIC AUTOMATION COMPANY**

Domestic Automation Company ("DAC"), by its attorneys, and pursuant to Section 1.415 of the Commission's Rules, hereby comments on the changes to Parts 2 and 90 of the Commission's Rules proposed in the Notice of Proposed Rule Making (FCC 93-141, released April 9, 1993) (the "NPRM") in the above-referenced proceeding.

In the NPRM the Commission has proposed new rules to promote the growth of Automatic Vehicle Monitoring (AVM) systems and to accommodate the location of all objects, animate and inanimate, by the creation of a new Location and Monitoring Service ("LMS") in the 902-928 MHz band. DAC opposes the proposed expansion as it will severely impact and curtail the effective use of this band by Part 15 devices, generally, and DAC's current and anticipated products, specifically. A more limited change to the rules, designed appropriately to give a

permanent status to the existing AVM regulations should instead be adopted in this proceeding. <sup>1/</sup>

# I. BACKGROUND.

## A. DAC's Interest

DAC was established in 1985 <sup>2/</sup> to develop systems for the nation's utility companies who desired to automate their power distribution networks. Its first efforts were aimed at adding computer functions to the electromechanical meters used to measure electricity consumption. In 1989, taking advantage of the FCC rules and policies that had been formulated to encourage the development of spread spectrum technologies in lower cost, low power applications, DAC began the development of its CellNet™ data communications system. CellNet™ is a wireless communications system designed to support the data acquisition, system monitoring and system control requirements of the electric, gas and water industries.

The CellNet™ system is composed of two critical elements. The first is a high-performance Wide Area Network, operating at licensed frequencies in the 900 MHz band allocated under Part 94 for use by utilities in Multiple Address Systems. DAC's WAN improves on traditional MAS technology by applying low-

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<sup>1/</sup> DAC has also actively participated in the efforts of the Part 15 Coalition which is contemporaneously also filing comments herein. The positions set forth in those comments will not be fully repeated here but are instead incorporated

powered transmitters in a cellular-based configuration using advanced frequency subdivision, so that an entire seven-cell frequency reuse pattern can be supported using only two 12.5 kHz MAS channels. <sup>3/</sup>

The success of the CellNet™ system is also due to its ability to deliver a reliable, low cost, low power Local Area Network. In DAC's case, the PowerLAN™ product line employs microprocessor-based spread spectrum technology <sup>4/</sup> in the 902-928 MHz band, as authorized under Section 15.247 of the Rules. The DAC PowerLAN™ gives the CellNet™ system the ability to provide distributed two-way communications features incorporated into individual utility meters. The PowerLAN™ network can accommodate several hundred end devices, with a throughput of 19,200 bits per second and a range of over 2,500 feet. This gives utility companies unequalled cost advantages in furthering the nation's interest in energy consumption economy.

DAC has been working on these spread spectrum developments for several years, with the next generation of

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<sup>3/</sup> With this technological innovation, utilities can blanket substantial areas of coverage in an inherently modular growth approach, at far lower costs and with much higher coverage reliability.

<sup>4/</sup> By concentrating much of the requisite intelligence out of the utility meters into neighborhood-shared concentrators, substantial cost savings can be realized. At the same time, a variety of new and innovative demand-side management applications, e.g., time of use and kWh billing, load research, remote meter reading and servicing, real time pricing, pressure regulator monitoring, and load control, can all be accomplished on a two-way, low cost basis. Future non-utility applications, e.g., alarm safety monitoring, traffic light control, can also be accommodated.



spread spectrum systems scheduled for commercial rollout early next year. To the extent, therefore, that the viability of the Part 15 allocations for spread spectrum technology are being threatened in this proceeding, DAC has a substantial interest in the proposals.

B. The History of the AVM Rules

AVM systems have operated in the 902-928 MHz band for nearly twenty years under Section 90.239 and its predecessor provisions, the so-called "interim" rules adopted in 1974.<sup>5/</sup> When these rules were adopted, the Commission recognized that the state of vehicle location technology had progressed dramatically since 1968, when the agency had initiated its consideration of AVM technology. Nevertheless, it decided that, given the early stages of development, the rule changes would be only interim provisions to "allow for continued technological advancements in the different techniques involved."<sup>6/</sup>

In addition to liberalizing the rules for such systems operating in the land mobile allocation below 512 MHz, the Commission chose to create a focused allocation for AVM in the 902-928 MHz bands. The agency expressed its hope that "with the impetus of these interim provisions, the next decade should see vehicle location methods as an essential adjunct to the successful operation of many land mobile radio communications

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<sup>5/</sup> Report and Order, Docket 18302, 30 RR2d 1665 (1974).

<sup>6/</sup> Id., at para 5, p. 1667.

systems." <sup>U</sup> In fact, however, over the next fifteen years very limited AVM system developmental activity took place in the 902-928 MHz band.

Indeed, the impetus for this rulemaking was not an overwhelming growth of AVM networks; rather, one of the few companies engaged in the development of AVM systems, North American Teletrac and Location Technologies, Inc. (Teletrac) urged that after some 18 years the AVM rules needed to be made "permanent" in order to facilitate the financing of further expansion of these services. Not surprisingly, the long-term nature of the "interim" status of the rules made venture capitalists and customers alike somewhat nervous about making lengthy commitments to such systems. The relatively limited nature of the initial request is paled by the more substantive changes that have been proposed by the Commission in the NPRM.

C. The Development of Part 15 Uses in the 902-928 MHz Band.

While there has been little growth in the development of AVM systems until quite recently, the Commission has seen the development of a growing number of low power, lower cost unlicensed devices and systems utilizing advanced technologies under its more liberal Part 15 regulatory scheme. To accommodate such advances, the Commission allowed the use of several otherwise underutilized ISM bands, including the 902-928 MHz band, for advanced Part 15 applications. Starting with the 1985 announcement of new rules for spread spectrum products in Docket

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<sup>U</sup> Id., at para 15, p. 1672.

No. 81-413, <sup>8/</sup> and continuing through the 1989 revision of Part 15 in Gen Docket 87-389, <sup>9/</sup> the Commission affirmatively encouraged designers, manufacturers, system developers and entrepreneurs to use these bands to develop new technologies and services.

The agency recognized that liberalizing the rules governing the use of these bands would have a significant impact on development of low powered, advanced technology devices and systems for use by the consuming public. For example, among the most innovative proposals in Docket 87-389 was one to permit Part 15 devices to operate in the 902-928 MHz band virtually without restriction on channelization, bandwidth or type of operation (the primary restriction being on the field strength of emissions). As the Commission stated in proposing this liberal approach, "we expect this proposal to foster entire new categories of Part 15 devices and to provide major benefits to both manufactures and consumes." <sup>10/</sup> The Commission in a separate, but related action, contemporaneously took similar steps to spur the development of consumer-oriented spread spectrum applications, rewriting, in July, 1990, the rules governing such devices in several bands, including the 902-928 MHz band. <sup>11/</sup> It again noted that:

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<sup>8/</sup> Spread Spectrum Systems, 101 F.C.C.2d 419 (1985).

<sup>9/</sup> Revision of Part 15 (First Report & Order), 4 FCC Rcd 3493 (1989).

<sup>10/</sup> Revision of Part 15 (NPRM), 2 FCC Rcd 6135 at 6137 (1987).

<sup>11/</sup> Spread Spectrum Systems, 5 FCC Rcd 4123 (1990).

The number and nature of possible applications for low power spread spectrum systems are increasing rapidly. We desire to encourage the development and implementation of this exciting new family of technologies. <sup>127</sup>

As hoped and predicted, many new and innovative uses of the Part 15 allocation in the 902-928 MHz band have been developed over the last several years. These products include remote control, cordless telephony, anti-theft devices, local area networks, and other communications products that have been, or are, likely to become staples of consumer and business users

The primary premises for the Commission's decision to expand the definition of the AVM Service are (a) that there is a growing demand for AVM services, specifically, and for systems that monitor or locate any object, animate or inanimate, generally, not only by businesses and local governments, but also by individuals; and (b) that such demands must be accommodated as part of an AVM/LMS radio service. Neither premise has been supported.

It must be stressed that AVM technology has existed for

Commission virtually reallocates 16 megahertz of spectrum to such services, (and makes the remaining 10 megahertz much less useful for others) a far more substantial showing of need must be made. The showing by the proponents of AVM and/or LMS falls far short of the types of demand studies and analyses normally required of the proponents of new radio services or the expansion of existing services. Given a desire to effectively control a spectrum allocation nearly as large as the allocation available for cellular systems, and far larger than those available to the myriad of SMR systems, a heavy burden should be imposed on the proponents here. As the Commission's decade long activities adequately establish, <sup>14/</sup> spectrum in the 900 MHz range is an extremely valuable commodity; whether it should be handed over for these types of services is therefore clearly a matter for close scrutiny.

Nor is it clear that any demand that is ultimately documented needs to be accommodated in a new, separate radio service. There are numerous wireless alternatives in existence or under consideration which are almost certain to embrace these types of location and monitoring services. For example, Mobile Satellite services are being developed in the 1.6 GHz band which will provide region and nationwide radiolocation services, which may be adaptable to the types of localized offerings under

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<sup>14/</sup> Since 1982 the Commission has considered allocations for Mobile Satellite Services, Air-to-Ground Radio Services, the expansion of the Cellular and Land Mobile Services, and more recently for PCS, all with much debate and substantial consideration.

consideration here. The capacity of the cellular and wide area SMR systems is being expanded with the use of digital technologies that will encourage a variety of non-voice applications -- including, presumably, location and monitoring services, utilizing both wideband and narrowband technologies in the 900 MHz band.

Indeed, just last week the Commission allocated up to three megahertz in the 901, 931, and 941 MHz bands for so-called Narrowband-PCS services, <sup>15/</sup> in a docket which was initially adopted to consider spectrum requirements for advanced messaging services. There is no reason to believe that some of the narrowband alternatives that might otherwise appear in the proposed LMS can not and will not be far better served in the Narrowband PCS spectrum in which there are currently no competing users.

A similar argument can be made for delaying consideration of the anticipated location and monitoring services that might develop from wideband AVM technology until the further development of wideband PCS rules is completed in the Fall. The Commission has proposed to allocate up to 200 MHz in the 1.9 GHz band for such wideband, licensed systems (with up to another 200 MHz currently being considered for reassignment from the Government spectrum to Non-Government uses). If there is, indeed, a need for new and innovative location and monitoring

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<sup>15/</sup> See, e.g., News Release "FCC Amends Rules to Establish New Narrowband Personal Communications Services" (Gen. Docket No. 90-314, ET Docket 92-100).

services, the preferred place to establish is probably as part of the creation of an overall PCS service, and not in the spectrum that has to date only been used for the highly specialized and far more limited vehicle monitoring activities of the current crop of AVM licensees.

Ultimately, the Commission must decide first whether there really is a need to provide for any expansion of the existing AVM services, and if so, if the expansion should be



the new frequencies. Indeed, the instant proposal has raised the reasonable fear that in choosing to expand the licensed uses of the 902-928 MHz band, the Commission continues bound to the established hierarchy of use in which the congestion inevitable from the expansion of LMS services will quickly obsolete existing systems and virtually wipe out the benefits of concepts still in the developmental stages. <sup>16/</sup>

By the same token, the NPRM provides a reasonable opportunity for the Commission to review and refine its policies toward Part 15 devices. In particular, this proceeding allows the Commission to recognize the substantial public interest benefits derived from devices operating under Part 15 so that

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<sup>16/</sup> Because of their receiver sensitivities, it is almost certain that some number of LMS systems will be subject to or the subject of interference from the wide array of Part 15 devices that currently operate in, or have been reasonably planned for, the 902-928 MHz band. Indeed, Teletrac has already been involved in such interference incidents. To date AVM systems have not proliferated, and are limited in their intended use to a relatively specific purpose, so that coordination among likely interference sources has been relatively manageable. To the extent that the number and use of such systems grows substantially, while at the same time the uses of the band for Part 15 applications also grows, the likely number of interference incidents is certain to become quite problematic. Unfortunately in this regard, systems like those offered by DAC, which involve a large number of radio units within a single system operated in a business environment, are far more likely to be the target of the AVM system licensee than consumer products, sold on a one or two units basis, even if the DAC units are not the primary source of the interference. As a result, this increase in interference

policies can be developed which better accommodate competing uses of the spectrum to meet the public interest.

Given the substantial anticipated demands on the radio spectrum as the telecommunications infrastructure changes from one that is almost exclusively based on wired facilities, to one heavily dependent on wireless architectures, low power unlicensed devices which can significantly increase spectrum utilization must be encouraged. The DAC PowerLAN™ provides an excellent example of such advances, greatly enhancing the nation's utilities' ability to manage their distributed networks, furthering this nation's energy conservation policies. Surely, manufacturers who take advantage of the Part 15 regulations to significantly increase spectrum utilization and efficiency should no longer be forced to do so solely at the pleasure of those who are using the spectrum on a licensed basis. To that end, it should no longer be the rule that licensed devices are protected and the unlicensed products must give way when new radio service allocations or expansions are being considered. Rather, the Commission should give Part 15 uses of the spectrum fair consideration and weight in determining the suitability of spectrum for additional congestion from newly considered licensed or unlicensed services.

This proceeding is an appropriate forum now to consider policies that balance spectrum utilization and efficiencies with interference protection requirements. In particular, the Commission can properly conclude that non-AVM uses can be

accommodated in other parts of the spectrum under consideration for a wide array of non-voice messaging services.

B. AVM Rules Should Be Modified To Provide Channels Actually Justified By Anticipated Needs

Absent a far more compelling showing by AVM/LMS proponents than has been made to date, it is not inappropriate in DAC's view for the Commission, in making the AVM rules "permanent", to consider whether AVM systems, both wideband and narrowband, can be accommodated in a total of eight megahertz (consisting of two slots of four megahertz each at either end of the 902-928 MHz band) <sup>17/</sup> rather than the sixteen megahertz currently available but rarely utilized. In so doing, it is also appropriate to review the actual utilization of any AVM licenses already issued.

Such a decision can surely be justified on the basis of spectrum efficiency. It will assure that AVM systems act responsibly in obtaining the most spectrally efficient designs as they become more proliferate. Such an approach would also have the benefit of avoiding the natural congestion of Part 15 users

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<sup>17/</sup> The record simply does not support the need for 16 megahertz for the existing or planned and reasonably anticipated AVM uses. Given the likely substantial number of technological alternatives that do and will exist, there is no basis for expanding the spectrum available to these systems. Indeed, given the premise on which Teletrac approached the Commission for the rules change -- the need to remove the "interim" nature of the allocation and rules to provide investment certainty and security -- expanding the available allocation beyond that which the proponents acknowledge they are currently utilizing, particularly at the expense of Part 15 manufacturers who are in fact utilizing all parts of the band, is clearly inappropriate. To accommodate current systems, the new allocations should be centered around 908 and 922 MHz.

into the very narrow middle portion of the band. On the other hand, if the requested 16 megahertz is in fact allocated, Part 15 developers will be forced to design systems into the very narrow middle channels to avoid the licensed AVM services that are not even using the extra eight megahertz, a truly inefficient approach to spectrum management.

### III. CONCLUSION

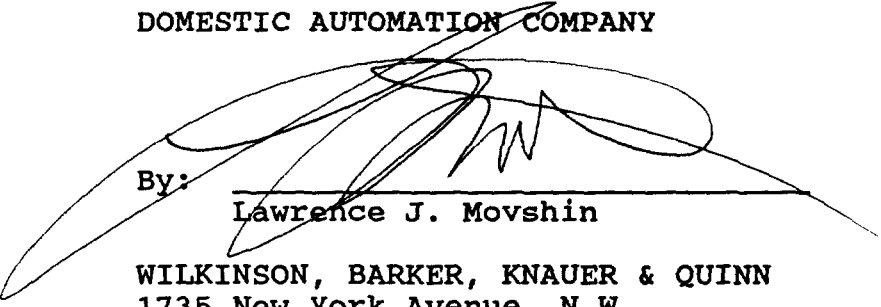
The Commission made the right public policy decisions in 1989 when it initiated rules designed to encourage the development of Part 15 devices in the then-underutilized ISM bands, including the 902-928 MHz band. The benefits of those decisions are already being seen in the substantial proliferation of low-power, spectrally efficient devices, for commercial and consumer uses, alike, authorized under the new sections of Part 15. DAC provides an excellent example of entrepreneurial activities that have been encouraged by such FCC decisions, and that have resulted in substantial technological advances with significant public benefits. The Commission should not take action here that will have the effect of emasculating that action. The current balance between Part 15 and AVM systems is generally working. Other than giving the AVM industry the certainty of permanency in the rules that govern their use of the 902-928 MHz band, and those other rules designed to protect themselves from inter-system interference, no other expansion of

the uses of the band or eligibility under these rules is  
necessary or appropriate at this time.

Respectfully submitted,

DOMESTIC AUTOMATION COMPANY

By:



Lawrence J. Movshin

WILKINSON, BARKER, KNAUER & QUINN  
1735 New York Avenue, N.W.

Washington, D.C. 20005